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ABSTRACT

A study was undertaken at Central Piedmont Community College (CPCC), in North Carolina, to examine student opinions of services and factors influencing student satisfaction with the overall quality of CPCC. Questionnaires were distributed to 4,500 students in randomly selected classes in fall 1992, soliciting information on student characteristics, reasons for enrolling, and satisfaction with CPCC. Study findings, based on 2,375 completed questionnaires, included the following: (1) 24.1% of the students first entered CPCC from high school graduation and 29.6% from the workforce; (2) the two most important factors given by respondents for choosing CPCC were low tuition and desired academic program; (3) respondents showed the highest level of satisfaction with library facilities and services and the quality of full-time faculty; (4) industrial arts/shop facilities received the lowest ratings, although about 40% considered these facilities to be good or excellent; (5) registration and the bookstore were the most used services by respondents, and were ranked two and three in satisfaction of service; (6) while the attractiveness of the campus and overall image received the highest ratings of campus amenity factors, over 70% of respondents thought that parking facilities/availability and eating facilities were average or poor; and (7) an analysis of factors influencing student satisfaction indicated that the specific areas of admissions, classroom facilities, instructor availability, and the helpfulness of CPCC staff were directly and significantly related to ratings of overall quality. The survey instrument and a summary of student comments are appended. (BCY)

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ED 367 397

Central Piedmont Community College

Current Student Opinion Study

1992-1993

*Assessing Provision of High-Quality,
Flexible Educational Programs and Services
to Meet Individual and Community Needs*

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Central Piedmont Community College
Planning & Research Department

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CENTRAL PIEDMONT COMMUNITY COLLEGE
CURRENT STUDENT OPINION STUDY
EXECUTIVE SUMMARY

The purpose of the Current Student Survey was to examine student opinions of services and factors influencing student satisfaction with overall quality of CPCC.

There were 4500 Current Student Opinion surveys distributed by instructors to randomly selected fall 92 classes. A realized sample of 2,375 completed questionnaires was analyzed to provide information about CPCC students.

The complete report with appendixes will be distributed to the Cabinet and Deans. This executive summary provides:

1. Highlights of student background and reasons for selecting CPCC.
2. Satisfaction of students with specific areas of service/instruction and overall satisfaction of students with CPCC.
3. Student opinions on reasons for drop-outs, campus environment, best liked items and needs for improvement.

Description of Students

- Over 50 percent of students first entered CPCC from high school graduation (24.1) or from the work force (29.6).
- Family income level and parents educational attainment were influential factors to students' achievement.
- Low tuition cost and desired academic program are the two most important factors for selecting CPCC.
- Fifty-nine percent of students attend class in the morning and 42 percent prefer this time. Of the 314 that indicated they attended the afternoon college, 91 percent indicated they preferred that time of day.

Satisfaction of Students

- Students showed high satisfaction with facilities and service of the library (mean 4.03 out of possible 5) and quality of full-time faculty (4.0 out of possible 5). No area was lower than 3.3.
- Services ranked lower in satisfaction than facilities. Also, those services less used tended to rank lower.

- Registration and the Bookstore were the greatest used services. These also ranked two and three in satisfaction of service. Talking with instructors about performance ranked first.
- Instructors represent a strong factor for student overall satisfaction. There are strong relationships between talking with instructors, evaluation of both full and part-time instructors, and overall satisfaction.
- ✕ • Attractiveness of campus and overall image of CPCC had highest rating of amenities, while student parking availability had the lowest.
- Helpfulness of staff, talking with instructors, classroom facilities and quality of admission services are important contributors to the overall satisfaction and quality rating of students.

Reasons Students' Drop-out

- Personal problems unrelated to school was the most important reason for dropping out. Parking difficulties was not an important factor in drop-out.

Campus Environment

- All of the social environmental factors received a higher than average comfort level. The mean range was quite narrow, from 3.42 to 3.78.
- Students who felt comfortable with the social environment of the college tended to give higher overall quality rating by about 0.5 in a 5 level scale.
- ✕ • Program information distribution is most satisfactory by schedule that comes in the newspaper, with 70 percent giving that the highest rating. Eighty-five percent of students would like to have the class schedule "mailed to my address".

Liked Best about CPCC

- Instructors
- Low cost
- Convenience of location
- Quality education

Most Important Needs for Improvement

- ✕ • Parking - need additional decks
- ✕ • Security, especially at night
- ✕ • Standardization of instruction
- Registration - continuous, improve lines

Central Piedmont Community College

Current Student Opinion Study

1992-1993

Planning & Research Department

1. INTRODUCTION

Student opinion is an important indicator of strength/weakness of services and performance of an educational institution and a crucial measure of accomplishment of the institutional mission. In the past, Planning & Research, CPCC, conducted a number of survey studies¹ to reveal student opinion and success, and to evaluate CPCC's qualities.

This study systematically examines the relationship between the services and performance of the college and student satisfaction with the overall quality of CPCC. The research findings show which factors may have contributed to CPCC's overall image and quality, and which factors may have negatively influenced student satisfaction with the overall quality of the college. The research findings provide the college decision makers with useful information about CPCC's strength which should be maintained and possible weakness which needs to be improved.

This report is organized as follows. Section 2 describes the methodology of the study. Section 3 presents findings of descriptive statistical analysis of the current student background, the factors affecting student selection of CPCC and particular programs, student opinion of facilities and services, and student opinion of other amenity factors. Section 4 investigates the relation between student satisfaction and major factors influencing student overall opinion. Section 5 concludes the report with highlighted findings and research implication.

¹ Interested readers may consult the documents, STUDENT EVALUATION OF SERVICES, 1991, GRADUATE FOLLOW-UP STUDY, 1990-1991, and GRADUATE FOLLOW-UP STUDY, 1991-1992. These documents were distributed throughout the college and may be reviewed in the Planning and Research Department.

2. PURPOSE AND METHODOLOGY OF THE STUDY

The purpose of the study was to examine current student opinion of CPCC's services and investigate the factors influencing student satisfaction with the overall quality of the college. Given the large number of service areas and campus factors, it is expected that each area performs differently. First, a descriptive statistical analysis was conducted to reveal the average and deviation of distribution of student background variables and opinions. The findings of this analysis can point out which areas are considered weaker by the current students.

The overall quality of an institution is jointly determined by many service areas and other internal factors. To draw a clearer picture of the relationship between the overall quality and a large number of potentially relevant factors, a multivariate statistical method was employed in this study. The statistical model yields an estimate of the impact of each college internal factor on the overall quality of the college, while controlling for external intervening factors. The research findings can be used to initiate or support the most cost-effective proposal to improve CPCC's overall performance.

The overall quality of an institution is a global concept, and no universally accepted measure of the concept is readily available. However, student satisfaction with the overall quality of the institution can largely reflect the real quality of the institution, especially if the mission of the institution is to serve students in advancing the life-long educational development and preparing them for their employment. More precisely, the student satisfaction is a quality grade the college receives from their students. This research treats the student satisfaction with the overall quality of CPCC as a proxy measure of the quality and performance of the college. By the same token, the study treats student opinion of each individual factor (facilities, services, or amenities) as an indicator of the quality of the factor. In so doing, we are able to convert college quality variables, which are not directly measurable, to student opinion variables, which are directly measurable. Relevant information regarding the quality of the college can be collected from the students.

A survey instrument was designed with input from throughout the college to gather information about student background, external influential factors, student opinion of CPCC's facilities and services, and student satisfaction with the overall quality of the college. All full-time and part-time students enrolled in CPCC in the fall quarter 1992 constitute the study

population. To balance cost and effectiveness, a stratified sampling was taken to generate a sample to represent current students in all areas and departments. The questionnaires were distributed to 4500 students through instructors whose classes were selected in the sampling. A realized sample of 2375 complete questionnaires was sufficient in size to represent the study population and to cover a large number of dimensions of variations (indicated by the number of variables included in the statistical model).

3. DESCRIPTIVE STATISTICAL ANALYSIS OF STUDENT OPINION

Descriptive analysis allows us to take a first look at the variations of student background and opinion of services and qualities of CPCC. This section presents findings in all of the relevant aspects.

3.1. STUDENT BACKGROUND

What is the distance students travel (one way) to attend class ?

To examine the size of area and distribution of population CPCC central campus serves, information about the distances students travel to attend classes was collected. The descriptive statistics indicate that a vast majority of students (about 80 percent) live in places within a distance of 20 miles from central campus with a weighted average of 13.5 miles. However, the college's service area includes places more than 30 miles away with about 7 percent of students from those places. Since an earlier study shows that 95 percent of the residents of North Carolina live within a 30-mile radius of a community college and 15-mile radius service areas still frequently overlap in most areas of the state², we can infer from the current study that CPCC provides students with some special educational opportunities not available from neighboring colleges. Table 3.1 presents the geographical distribution of enrolled students.

² See Program and System Structure, The North Carolina Community College System, GPAC study, 1992.

Table 3.1 Distance to CPCC

DISTANCE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0- 3 miles	300	12.7	300	12.7
4-10 miles	927	39.4	1227	52.1
11-20 miles	651	27.7	1878	79.8
21-30 miles	317	13.5	2195	93.2
31-50 miles	138	5.9	2333	99.1
> 50 miles	21	0.9	2354	100.0

Mean = 13.5 miles
Frequency Missing = 21

What were students doing before they first entered CPCC ?

Education and work experience of students prior to attending CPCC are important background information about the students and population CPCC serves. According to the survey statistics, high school graduates and working adults with formal jobs constitute approximately half (53.7 percent) of the students being surveyed. The rest of the students spread among many other categories with different education and work background. The findings indicate that CPCC is able to provide flexible education services to meet the needs of a population with diverse education/work experience. Table 3.2 presents detailed statistics of the student background.

Table 3.2 Education/Work Experience before Entering CPCC

BACKGROUND	Frequency	Percent
Before HS Graduate	93	3.9
After HS Graduate	573	24.1
Working	704	29.6
2-yr college transfer	92	3.9
4-yr college transfer	186	7.8
Military services	101	4.3
Raising family	204	8.6
Other	422	17.8

Where do students currently live ? How many people in their household depend on them for financial support ?

The information about student status as a head of household and the number of dependents is important not only because this information reveals the population CPCC serves but also because these background factors can affect the student performance and expectation for the college. Table 3.3 and Table 3.4 present these statistics. The figures in Table 3.3 show that a large part of students tend to either be minors living with parents (38.4%) or married adults living with spouses (29.4%), and all other categories in combination constitute no more than a third of the total number of students. This suggests that many parents prefer CPCC to other institutions of higher education for their children's education. The reasons for the students to choose CPCC will be examined in the later sections. The statistics in Table 3.4, on the other hand, imply that 34.7% of the students must financially support at least one dependent (65.3% of the students do not have dependents). This composition of students is obviously different from many four-year colleges, indicating that CPCC provides many working adults with educational opportunities which may not be available from other institutions of higher education.

Table 3.3 Place or Person to Live With

	Frequency	Percent
Parents	868	38.4
Spouse & kids	666	29.4
Kids, no spouse	123	5.4
Other relatives	67	3.0
Board w/ a family	32	1.4
Myself	239	10.6
Friends/roommates	241	10.6
Other	27	1.2
Frequency Missing = 112		

Table 3.4 Percentage Distribution of # of Dependents

Age of Dependents	Number of Dependents					
	0	1	2	3	4	>4
Under 5 years	84.8	14.7	0.3	0.1	0.1	0.0
5-9 years	92.0	7.9	0.1	0.1	0.0	0.0
10-14 years	93.5	6.4	0.1	0.0	0.0	0.0
15-19 years	93.9	6.0	0.1	0.0	0.0	0.0
20-24 years	94.5	5.4	0.1	0.0	0.0	0.0
25 and older	90.6	9.3	0.1	0.0	0.0	0.0
All Ages Combined	65.3	22.4	8.6	3.0	0.3	0.3

What was the total income for students and their spouse in the past year? What was the income of student parents?

Families with higher income tend to provide their children with more financial support. Generally, family income level and parents' educational attainment are influential factors to students' educational achievement and their expectation for the college. The background information acquired from the survey was summarized in Table 3.5 and Table 3.6. Both student personal income and parents' income are very diverse, widely spread in ten different levels with average student annual income of \$22,832 and average parents income of \$35,900. Because of the large number of records with missing data on parents' income, the statistics for parents' income are less reliable. The even distribution of student and parents' income among many levels confirms the wide scope of the population CPCC serves. The significant amount of income earned by the average students suggest that many students have formal jobs while they attend CPCC programs.

Table 3.5 Personal annual income

INCOME LEVEL	Frequency	Percent
Less than \$5,000	318	19.1
\$5,000- \$10,000	228	13.7
\$10,000- \$15,000	191	11.5
\$15,000- \$20,000	166	10.0
\$20,000- \$25,000	133	8.0
\$25,000- \$30,000	109	6.5
\$30,000- \$35,000	73	4.4
\$35,000- \$40,000	101	6.1
\$40,000- \$50,000	110	6.6
\$50,000 or more	239	14.3

Mean³ = \$22,832

Frequency Missing = 707

Calculation of the mean does not include those records with missing data.

Table 3.6 Parents' annual income

INCOME LEVEL	Frequency	Percent
Less than \$5,000	62	8.0
\$5,000- \$10,000	30	3.9
\$10,000- \$15,000	37	4.8
\$15,000- \$20,000	52	6.7
\$20,000- \$25,000	47	6.1
\$25,000- \$30,000	56	7.2
\$30,000- \$35,000	55	7.1
\$35,000- \$40,000	82	10.6
\$40,000- \$50,000	92	11.9
\$50,000 or more	263	33.9

Mean = \$35,900

Frequency Missing = 1599

What is the highest level of education students' parents completed ?

Normally, better educated parents are more likely to help their children academically. Table 3.7 presents the distribution of the highest level of education students' parents completed. In comparison, educational attainment of students' parents is fairly concentrated in fewer groups: high school graduate, college graduate, and two years of college, in descending order. About a half of the students' parents did not receive college level education, implying that a half of CPCC students tend to do better than their parents in their academic achievement. This progress can be due to the effort these students have made and can also be attributed to the services CPCC provides to the traditionally underserved population.

Table 3.7 Highest Level of Education Parents have Completed

HIGHEST LEVEL	Number	Mother %	Number	Father %
8th Grade or Less	115	4.8	169	7.1
9th-11th Grade	160	6.7	159	6.6
High School Graduate	742	31.2	598	25.2
GED diploma	73	3.1	68	2.9
One year beyond High	175	7.4	121	5.1
Diploma Program	51	2.1	53	2.2
Two Years of College	238	10.0	183	7.7
Associate Degree	123	5.2	114	4.8
Three Years of College	49	2.1	56	2.4
College Graduate	318	13.4	455	19.2
Graduate Work	129	5.4	204	8.6

3.2. FACTORS AFFECTING STUDENT SELECTION OF CPCC AND PARTICULAR PROGRAM

There exist two sets of potentially important factors which may result in student selection of CPCC and particular programs. The first set is internal factors which may be modified by the college. The second set is external factors over which the college generally has no control.

What CPCC-related factors influenced students' selection of CPCC and particular program/class ?

In the survey, the questions were directly asked about the importance of a set of factors in influencing student selection of CPCC and program/courses. The answers are based on a five-level scale with 1 being 'not important', 3 being 'somewhat important', and 5 being 'very important'. Table 3.8 and Table 3.9 present the summaries of the survey results. The factors are organized in descending order according to sample mean^{*} such that the factor most students consider as the most important is on the top and the second important on the second place and so on.

Table 3.8 shows that among other college-related internal factors, desired academic program and low tuition are the most important factors affecting student selection of CPCC. More than half of the students consider the two factors very important and mean scores for the two factors are 4.27 and 4.21 respectively. Other factors with some influence include academic reputation, flexibility of being able to work while attending the college, convenient location, easy transfer of credits, small class, relevance to job, and strong academic advising, in descending order. About two-thirds to three-quarters of the students rate these factors somewhat important, important, and very important with mean scores of 3.11-3.79. The results indicate that these CPCC-related internal factors have influenced most students' decision to attend CPCC.

In contrast, most factors listed in Table 3.9 are basically irrelevant to student choice of program and/or class. Only a centralized location for classes has marginal influence on the

* Measurements of student opinions are at ordinal level as opposed to more precise interval level or more crude nominal level. In social research, people have debated about validity of calculating means of ordinal variables because of the lack of interpersonal agreed-upon standard or unit (see, for instance, Kenneth J. Meier and Jeffrey L. Brudney, 1987, *Applied Statistics for Public Administration*). This study is not intended to get involved in this debate. However, seeing the student opinion as a score the student assigned to a factor and weighting each student's feeling about the importance of the factors equally allow the researcher to compute average score for the factor. Therefore, we can compute the weighted average of importance of each factor.

student choice of program and/or class with mean score of 3.06. In combination with findings presented in Table 3.8, it can be inferred that it is the desired academic program and other outstanding features but not the different media CPCC employed to offer classes that influence student choice of program/class. To better serve this community, CPCC should focus on provision of student desired program/classes and not overemphasize the importance of the media of offering these classes. In addition, CPCC location and location for classes appear to have some influence on student choice of the college and program. Although location of the college and/or classes is not entirely dependent on CPCC's own preference, the research findings do support the consideration of locating satellite facilities or classes in areas with strong demand.

Table 3.8 Percentage of Students Considering the Importance of CPCC-Related Factors Influencing Their Selection of CPCC

Factors	1	2	3	4	5	Mean ^a
Offers desired academic program	3.4	2.5	15.2	21.4	57.6	4.27
Low tuition cost	5.2	2.8	16.6	16.0	59.4	4.22
Academic reputation	6.7	5.7	25.7	25.9	36.0	3.79
Could work while attending college	17.2	4.4	16.4	15.5	46.5	3.69
Convenient location	9.0	5.9	33.8	18.0	33.2	3.61
Easy transfer of credits	20.7	8.5	17.1	17.2	36.5	3.40
Small classes	19.4	7.3	27.5	20.6	25.2	3.25
Relevance to Job	25.4	8.6	18.6	13.8	33.6	3.21
Strong academic advising	19.2	11.0	30.8	17.7	21.3	3.11
Availability of job placement	23.5	11.6	23.8	15.2	25.9	3.08
Availability of financial aid	51.6	7.9	15.5	6.0	19.0	2.33
Recruiter/teacher/staff at CPCC	68.4	7.3	12.2	4.7	7.4	1.75

Table 3.9 Percentage of Students Considering the Importance of CPCC-Related Factors Influencing Student Choice of Program/Class

Factor	1	2	3	4	5	Mean
A centralized location for classes	28.3	6.2	25.0	12.0	28.4	3.06
Courses allowing work at your own pace	51.0	5.8	17.1	8.1	18.0	2.36
Courses offered off campus near home	51.6	6.3	16.0	8.7	17.4	2.34
Combination of TV and in-class learning	72.8	6.2	10.7	4.5	5.9	1.65
Courses offered at place of work	76.3	5.6	8.3	2.7	7.1	1.59
Courses offered on TV	75.5	6.0	10.2	3.6	4.7	1.56
Courses offered on videotape	76.6	6.0	10.4	2.9	4.0	1.52
Courses you can take by mail	82.3	4.9	8.0	1.4	3.4	1.39
Courses offered on radio	83.2	5.3	7.0	2.1	2.4	1.30

^a Construction of the mean does not include the records with missing values.

When do students primarily attend class ?

To evaluate the goodness-of-fit of the current class schedule into student preferred schedule, the relevant questions were asked and the student responses are summarized in Table 3.10. The statistics show that a majority of the students attend classes with schedule they like, but also a significant portion of the students may attend classes when they do not like the schedule. The big difference appears in the morning schedule when more than 400 students have to take classes which do not have their preferred schedule. Proportionately, about 40% more students attend the morning classes or the day and evening classes without preferred schedule. This information may be used as a reference for rescheduling some classes if necessary to meet student need.

Table 3.10 Students Attended and Preferred Schedule

Class schedule	Attended	Preferred	Difference	Percent Diff.
In the morning	1455	1046	409	39.1%
Afternoon College	314	286	28	9.8%
In the evening	472	381	91	23.9%
Both day and evening	231	160	71	44.4%

Who influenced students' choice of CPCC ?

Some factors not CPCC-related may also affect student choices of CPCC. Among the factors, student family members, friends, and teachers might play some rôle. Table 3.11 presents survey results about the importance of these factors, according to students' judgment with 1 being 'not important', 3 being 'somewhat important', and 5 being 'very important'. It is interesting to see that only parents and friends have moderate influence on the students' decision to attend CPCC and all other people listed have almost no impact at all. About 42% of the students consider advice of parents and friends somewhat important, important, or very important, but the mean scores for these two factors are only 2.47 and 2.36 respectively. Most students choose CPCC largely based on their own judgment of the quality CPCC possesses and/or the advantage CPCC provides. This finding suggests that service and quality of CPCC are well known to most people in the service areas and most students do not need much more additional advice to make their decision. It is also interesting to see that the reason the students attend CPCC is not because they are unable to make grades to attend another college. In combination, these findings imply that CPCC tends to provide desired services in a cost-effective way to the population in this area and the students elect to take

advantage of the opportunity.

Table 3.11 Percentage of Students Considering the Importance of Non-CPCC-Related Factors Influencing Student Choice of CPCC

Factors	1	2	3	4	5	Mean
Advice of parents	47.9	5.8	16.8	10.4	19.1	2.47
Advice of friends	45.9	8.5	23.7	7.8	14.2	2.36
Unable to attend another college	64.0	7.5	11.4	5.5	11.6	1.96
Accessible by public transport.	68.4	5.5	9.8	5.1	11.2	1.92
Advice of high school teachers	66.3	7.0	13.4	5.4	8.0	1.82
Spouse	72.0	3.1	9.6	4.2	11.0	1.79
Employer	70.6	5.6	10.9	3.9	9.0	1.75
Teacher at a 4-year school	71.4	5.3	11.1	4.8	7.4	1.71

3.3. STUDENT OPINION OF FACILITIES AND SERVICES

Availability and quality of all facilities and services determine the overall quality of an institution. Student opinion of each area of facilities and services of the institution is perhaps the only proxy measure for a study of this kind. Descriptive statistics are used to examine student opinion of each area of facilities and services. Student opinion is coded based on a five-level scale with 1 being 'poor', 3 being 'average', and 5 being 'excellent'.

What was student opinion of facilities and other campus factors?

Table 3.12 summarizes the survey results of student opinions. The facilities and services in the table are listed in a descending order according to the mean scores assigned by the students. This list helps us immediately point out the strong areas and weaker spots in accordance with the experience of a large number of students.

All of the facilities and campus factors except the last four factors are considered good or excellent by more than half of the students with mean scores from 3.61 to 4.03. Only about 10 percent or less of the students believe that qualities of these facilities and campus factors are below average. Library and quality of instruction of full-time faculty received the highest scores with means of 4.03 and 4.00 respectively. On the other hand, industrial arts/shop facilities and course availability got the lowest mean scores, 3.31 and 3.44 respectively, but still about 40 percent of the students considered the facilities and course availability good or excellent. In addition, accuracy of information received before students enrolled and helpfulness of administrators also appear to need improvement.

Table 3.12 Percentage Distribution of Student Opinion
of Campus Facilities and Other Factors

	Poor	Average			Excellent	
	1	2	3	4	5	Mean
Campus facilities and services						
Library	2.7	2.4	26.4	26.5	42.0	4.03
Quality of instruction of full-time faculty	2.1	3.1	26.2	29.2	39.1	4.00
Accessibility of resource materials	3.2	4.2	29.3	26.1	37.2	3.90
Quality of instruction of part-time faculty	4.2	4.7	29.0	26.0	36.1	3.85
Study and reading areas	5.4	5.3	30.4	22.9	36.0	3.79
Helpfulness of staff	4.6	4.7	32.9	27.3	30.5	3.74
Reading, Writing, language skills programs	6.2	5.2	32.8	21.1	34.7	3.73
Math skills improvement programs	7.4	4.6	32.3	20.3	35.5	3.72
Classroom facilities	3.4	3.7	44.4	24.7	23.9	3.62
Lab facilities	6.2	5.0	37.8	23.4	27.7	3.61
Helpfulness of administrators	6.5	6.7	37.1	24.2	25.5	3.56
Accuracy of information before enrolling	9.1	7.1	35.0	22.6	26.2	3.50
Course availability	8.8	9.9	34.2	22.5	24.6	3.44
Industrial arts/shop facilities	12.2	6.6	42.7	15.8	22.7	3.31

What was the student opinion of selected services?

To further identify the strength and weakness of particular services, student opinion of selected services areas were gathered. The statistics are summarized in Table 3.13. Except for the last four areas, all other services received mean scores of average or better, although the scores are not as high as those for most campus facilities. Talking with instructors about student performance, services of registration, bookstore, and admissions are regarded as the best among others with mean scores higher than all other services and only about 15 percent of students giving a score below average. However, co-op services, drop-in center, orientation program, and veterans services appear to have room to improve in order to meet student needs.

Table 3.13 Percentage Distribution of Student Opinion
of Selected Services

Type of Service	Poor	Average			Excellent	Mean
	1	2	3	4	5	
Talking with instructors about my perform.	5.3	4.0	40.9	17.0	32.8	3.68
Registration	9.1	6.1	35.2	20.7	28.9	3.54
Bookstore	7.4	6.7	39.1	20.6	26.2	3.52
Admissions	8.5	5.6	44.3	17.6	23.9	3.43
Early performance report	10.1	7.0	40.8	18.6	23.5	3.38
Placement testing and testing center	12.5	6.9	39.7	19.0	22.0	3.31
Welcome/information center	13.4	7.4	39.4	15.9	23.9	3.29
Academic advising by faculty	16.4	7.7	33.2	17.1	25.5	3.28
Counseling	15.6	8.7	32.5	18.5	24.7	3.28
Records/transcripts	14.1	6.6	39.7	18.3	21.3	3.26
Business office/Cashier	13.6	6.3	45.2	17.2	17.6	3.19
Job placement assistance	23.3	5.5	35.5	10.8	24.9	3.09
Services for students with disabilities	28.4	3.7	27.9	12.1	28.0	3.08
Financial aid	28.1	5.3	30.8	10.0	25.8	3.00
Co-op services	26.1	6.0	35.6	11.5	20.8	2.95
Drop-in center	28.9	5.5	37.4	9.2	19.1	2.84
Orientation program	23.1	10.8	40.2	11.6	14.2	2.83
Veterans services	44.0	5.6	29.1	7.8	13.4	2.41

How much did students use selected services?

Student opinion of each area of facilities and services may be related to utilization of the services, although causal direction is unclear. The survey study also takes this into account. Table 3.14 provides statistics describing how often each of these facilities and services are used by students. The order of service areas is reorganized according to the frequencies these services are used by students. A simple comparison between Table 3.13 and Table 3.14 clearly reveals that student opinions of these services are closely related to their use of these services⁶. Specifically, service areas considered to be the best by students are also the services most students use most frequently, while the areas receiving the lowest grades are also areas students use least. There may be two alternative interpretations for the close relationship: students may give a service area low grade because they are not familiar with the area, or they may avoid to use a service because they are not comfortable/satisfied with the service. The two interpretations imply two different causal directions. Because it is more likely that a majority of students tend to be neutral when grading unfamiliar service areas, the second interpretation cannot be eliminated conceptually. This finding supports consideration of making improvement in these service areas.

⁶ An exception is that in the survey we did not ask how often a student talked with instructors about his/her performance in class.

Table 3.14 Use of Facilities and Services by Students

Type of Services	Not used	Little used	Regularly used
Registration	8.0%	40.9%	51.1%
Bookstore	9.3%	42.9%	47.8%
Placement testing and testing center	26.5%	47.9%	25.6%
Admissions	15.9%	61.8%	22.3%
Business office/Cashier	32.6%	42.8%	24.6%
Counseling	37.9%	42.9%	19.2%
Academic advising by faculty	46.4%	36.4%	17.2%
Records/transcripts	34.9%	50.0%	15.1%
Welcome/information center	45.0%	42.9%	12.1%
Financial aid	76.1%	10.6%	13.3%
Orientation program	59.5%	34.6%	6.0%
Drop-in center	80.8%	14.0%	5.2%
Job placement assistance	82.4%	12.5%	5.1%
Veterans services	88.3%	6.6%	5.1%
Co-op services	85.2%	10.3%	4.5%
Services for students with disabilities	90.8%	5.4%	3.7%

Why do students drop out of classes ?

Students can also express their opinion of services and facilities indirectly. In the current student survey, a set of questions is asked to find why some students drop out of classes at CPCC. Students respond to these questions based on their judgments on these factors, given a 5-level scale with 1 being 'least important', 3 'average', and 5 'most important'. The descriptive statistics are reorganized, according to average score, and presented in Table 3.15. Among the five assumed reasons, 'personal problem having nothing to do with the college' is considered to be the most important reason causing some students drop out. Course difficulty and instructor also received higher-than-average score. About forty percent of students believe that course difficulty and instructor are 'important' or 'very important' reason of student drop-out. Parking difficulties, traditionally troubling spot in CPCC, receives a mean score of 2.02 with less than 15% of students seeing this as an important or very important reason of student drop-out.

Table 3.15 Assumed Reasons of Student Drop-out

Reasons	Least Important	Average			Most Important	Mean
	1	2	3	4	5	
Personal problem	10.1	7.1	19.5	18.8	44.5	3.80
Course difficulty	15.6	10.3	27.6	19.3	27.2	3.32
Other reasons combined	27.7	10.3	9.2	13.4	39.4	3.26
Instructor	15.5	15.8	28.9	17.3	22.5	3.15
Parking difficulties	49.6	21.3	14.3	7.1	7.7	2.02

In short, statistics presented in this subsection show some stronger areas and some weaker areas in CPCC. Since the picture drawn in the descriptive analysis may not be complete, it is not clear how each of these single factors is associated with the overall quality of the college. The relationship between these single factors and the overall quality of CPCC is examined in section 4 using a systematical method.

3.4. STUDENT OPINION OF OTHER CAMPUS AMENITY FACTORS

Campus amenities may also be responsible for student overall satisfaction with the college. Student opinion of campus amenities is treated as an indicator of the relevant amenity factor. The amenity factors may be divided into two groups. One is more physical or facilities-related. The other tends to be more social or psychological. Table 3.16 and Table 3.17 present the statistics of student opinion of the two groups of factors.

How was student opinion of student oriented amenity factors ?

Table 3.16 is also organized such that the factor with highest score is on the top and the factor with the second highest score is in the second and so on. Attractiveness of campus and overall image of the college receive the highest average scores (3.99 and 3.95) with more than 65% of the students assigning these factors scores of good or excellent. On the other hand, parking facilities/availability and eating facilities are considered average or worse by more than 70% of the students with sample means less than average (3 in a 5-level scale). Other remaining factors all receive about average score.

Table 3.16 Percentage Distribution of Student Opinion of Selected Student Oriented Amenity Factors

	Poor	Average			Excellent	
Factors	1	2	3	4	5	Mean
Attractiveness of campus	2.1	3.0	27.3	29.1	38.5	3.99
Overall image of CPCC	2.2	2.3	27.1	35.1	33.3	3.95
Personal security/safety	8.6	8.7	41.0	20.4	21.3	3.37
Student center, lounge area	12.2	10.7	43.2	16.2	17.8	3.17
Campus life (activities)	12.2	9.9	47.9	13.6	16.4	3.12
College newspaper (The Spark)	14.2	9.6	46.6	16.6	13.1	3.05
Eating facilities	17.3	13.7	43.0	14.1	11.9	2.90
Student government	17.2	13.8	45.8	12.8	10.4	2.85
Student parking facilities	25.7	13.3	36.3	13.1	11.6	2.72
Student parking availability	32.9	13.0	32.0	10.9	11.2	2.54

How was student opinion of social environmental factors ?

Amenity factors influencing student satisfaction can also be social environmental. Table 3.17 lists the factors, percent of satisfied students, and sample average of each factor. Obviously, all of the amenity factors receive a grade higher than average. However, unlike the physical factors listed in Table 3.16, these social environment factors are more difficult to be changed by school authority.

Table 3.17 Percentage Distribution of Student Opinion of Social Environmental Factors

Social Environmental Factors	Uncomfortable	comfort.			very conf.	Mean
	1	2	3	4	5	
Race relations climate	6.1	4.8	54.1	11.3	23.7	3.42
Presence of other people like me	3.7	4.5	45.9	16.0	29.9	3.64
Minority presence(students, faculty, staff)	5.1	4.3	53.7	13.5	23.4	3.46
Age of students in my classes	3.5	3.2	45.5	16.1	31.6	3.69
Sex of students in my classes	2.9	1.6	45.3	15.4	34.9	3.78
Social class of students in my classes	3.8	2.2	53.6	14.4	25.9	3.56
Academic ability of students in my classes	3.3	3.6	52.9	15.6	24.7	3.55
Jobs held by the students in my classes	3.7	2.4	56.0	13.6	24.4	3.53

3.5. PREFERRED CHANNEL FOR STUDENTS TO RECEIVE INFORMATION

Knowledge about the best channel to get students informed about courses and programs can help a college to reach students more effectively. The media used to inform students may also affect student opinion of services and quality of a college. Table 3.18 and Table 3.19 summarize student preferred channels of getting school information.

How would students like to receive information about the college ?

Table 3.18 shows that schedule that comes in the newspaper and college catalogs are the most popular choices among students with average scores of 4 or higher in a 5-level scale. The summary also indicates that radio advertising and television advertising are least important media to get students informed. This is probably because students need time to decide which program to apply for and which courses to take, and only those hard copies with this particular purpose can help them to do so.

Table 3.18 Preferred Channel of Receiving Program Information

Medium	Not at	Average			Very	Mean
	all 1	2	3	4	much 5	
Schedule that comes in the newspaper	4.9	1.7	11.1	12.2	70.1	4.41
College catalogs	8.6	4.2	19.8	17.6	49.8	4.00
Mailed circular that come to home	14.8	5.1	21.8	12.5	45.6	3.69
The Sunday <u>Charlotte Observer</u>	15.0	5.1	22.1	13.9	43.9	3.66
Newspaper advertisements	16.5	6.0	29.2	13.7	34.6	3.44
Stories that appear in the newspaper	24.5	10.7	35.5	12.7	16.7	2.86
"Win" and other brochures	30.7	10.1	27.0	11.4	20.8	2.81
Television advertising	28.8	10.9	32.5	10.0	17.9	2.77
Radio advertising	29.7	10.6	31.2	9.9	18.6	2.77

How would students like to receive class schedule ?

Table 3.19 presents a clear picture regarding student preferred channel of receiving class schedule: a vast majority (85%) of students want a schedule mailed to their homes and a small portion of the students preferred several other channels, a finding not surprising.

Table 3.19 Preferred Channel of Receiving Class Schedule

Medium	Students
Mailed to my address	85.0%
Pick up on campus	2.3%
In the <u>Charlotte Observer</u>	5.3%
In the <u>Charlotte Post</u>	0.3%
In <u>Creative Loafing</u>	0.6%
In <u>Break</u>	0.2%
Call and have a schedule mailed	1.1%
Missing	5.1%

3.6. COMPARISON OF CURRENT STUDENTS' AND GRADUATES' OPINIONS

To see possible dynamic changes of qualities of facilities, services, and amenities over time, this study compares 1992's current student opinion with 1990-91's graduate student opinion of the same factors. This comparison may help to find, from a student point of view, which areas became stronger over the past couple of years. Table 3.20 presents the mean scores of these factors for the two years⁷. Correlation coefficient of 0.65 between the two lists of scores indicates that areas which were stronger in 1990-91 are also tend to be stronger in 1992, but the changes in these areas are not proportional. More importantly,

⁷ Figures for 1992 are from Table 3.12, 3.13, and 3.15 of this section, while figures for 1990-91 are cited from Table 17, 19, 21, and 22 of GRADUATE FOLLOW-UP STUDY 1990-91.

except for parking, all areas seem to have received a lower score in 1992 than in 1990-91. Striking contrast appears in the following areas: services for students with disabilities (mean score dropped from 4.3 to 3.08), financial aid (from 4.1 to 3.00), co-op services (from 4.0 to 2.95), academic advising by faculty (from 4.2 to 3.28) counseling (from 4.2 to 3.28), business office/ cashier (from 4.1 to 3.19), and placement testing and testing center (from 4.1 to 3.31). This comparison may not be accurate due to the different groups of students (one is graduate, the other is current student) being surveyed, but we cannot eliminate the possibility that some areas of the college may not be as satisfactory as they used to be. These areas may need to pay more attention to the relation between their services and student satisfaction.

Table 3.20. Comparison of Mean Scores of Campus Factors
Between 90-91 and 1992

(1990-91 scores based on graduate students' opinion)
(1992 scores based on current students' opinion)

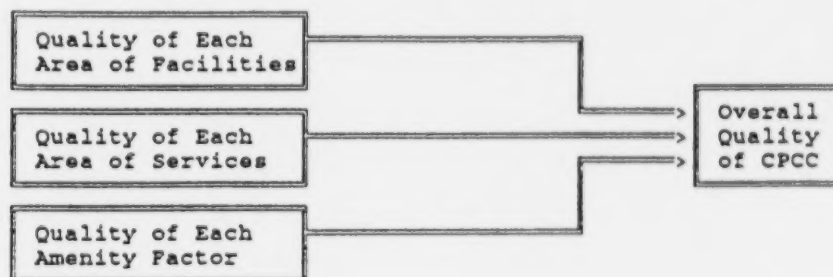
Facilities, Services, and Amenities	90-91	1992
Library	4.4	4.03
Quality of instruction of full-time faculty	4.3	4.00
Classroom facilities	4.4	3.62
Lab facilities	3.9	3.61
Course availability	3.9	3.44
Registration	3.8	3.54
Bookstore	3.6	3.52
Admissions	4.0	3.43
Placement testing and testing center	4.1	3.31
Academic advising by faculty	4.2	3.28
Counseling	4.2	3.28
Records/transcripts	3.8	3.26
Business office/Cashier	4.1	3.19
Job placement assistance	3.5	3.09
Services for students with disabilities	4.3	3.08
Financial aid	4.1	3.00
Co-op services	4.0	2.95
Student parking facilities	2.6	2.72
Student parking availability	2.6	2.54

4. INTERNAL AND EXTERNAL DETERMINANTS OF STUDENT SATISFACTION

4.1. INTRODUCTION TO THE ANALYSIS OF DETERMINANTS OF OVERALL QUALITY

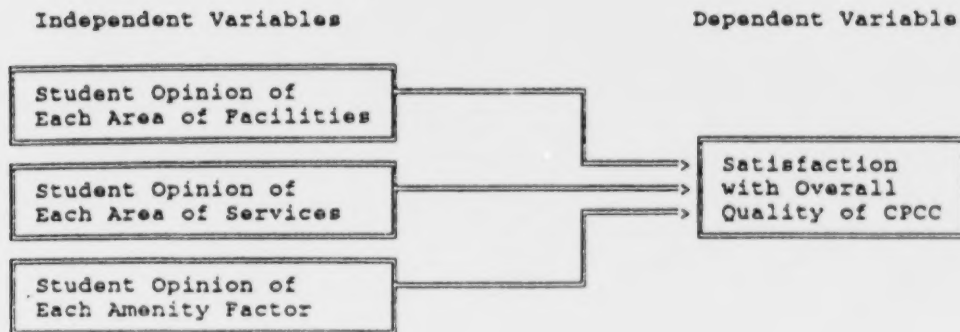
The overall quality of a college is the most important single measure of the institution. The overall quality is determined by many smaller areas of facilities, services, and amenities of the institution. However, not all areas contribute to the overall quality equally; some parts may be more crucial than others. It is essential to see the relationship between the overall quality and all of the individual areas in order to maintain and enhance the overall quality in a low cost-high impact manner. Figure 4.1 presents the relationship being investigated.

Figure 4.1 Relationship between Individual Facilities/Services and Overall Quality of the College



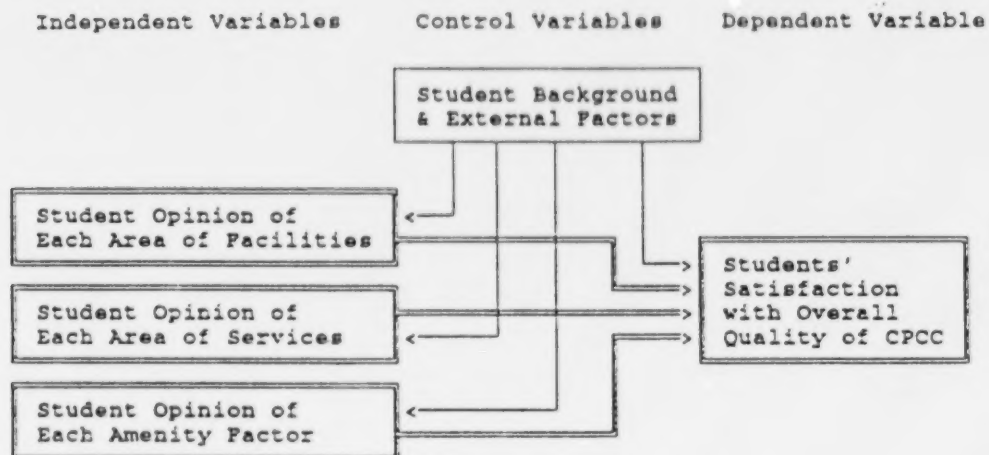
Unfortunately, there are no commonly accepted quality measures readily available. A study of this kind must create an indicator for each quality measure. As explained in section 2, this study treats the student satisfaction with overall quality of CPCC as a proxy measure of the quality and performance of CPCC. By the same token, student opinion of each area of facilities and services is a surrogate of quality of the individual area. The actual relationship being estimated is one between student opinion of each area of facilities/ services and student satisfaction with overall quality of CPCC. Figure 4.2 shows this relationship.

Figure 4.2 Estimated Relationship between Student Opinion of Individual Facilities/Services and Overall Quality of the College



Student subjective feelings are influenced by student social background, personal experience, and many other factors external to the college. To obtain a less biased estimate of relationship between student opinion/ satisfaction and quality of the institution, these influential external factors must be controlled in empirical research. Figure 4.3 provides a conceptual framework of relationships between different groups of variables.

Figure 4.3 Conceptual Framework for the Study



This study employs a statistical method to control the external factors when estimating the relationship between each facility/service area and overall quality of CPCC⁸. The estimates are expected to be much less biased than any descriptive statistics. Table 4.1 presents the parameter estimates and other statistics (Note: Readers who are not familiar with multiple regression estimates can skip over the table without losing substance). The internal and external factors are organized in several groups: background, factors affecting selection of CPCC and particular programs/classes, quality of each area of facilities and services, importance or preferred channel of receiving information, and qualities of other physical or social amenity factors. The major interest is in the estimates of facilities and services because the college has certain power to control and modify these factors.

⁸ Given a large number of internal and external variables in the survey, it is somewhat difficult to concentrate on the estimates of a few of major factors. This study uses stepwise regression to include the significant factors while dropping the insignificant ones. Moreover, potential collinearity of these factors is likely to appear and affect stability of estimates of the relationship. Therefore, a collinearity test should be performed. The result of the test shows that collinearity is minor and can be ignored in this study. The final version of multiple regression equation should represent the basic relationship between overall quality of CPCC and the quality of each area of important facilities and services based on student opinion.

**Table 4.1 Factors Affecting Student Satisfaction
with Overall Quality**

Dependent Variable: Student satisfaction with overall quality of CPCC

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob > F
Model	40	2289.77167	57.24429	39.090	0.0001
Error	2334	3417.94454	1.46441		
C Total	2374	5707.71621			

Root MSE	1.21013	R-square	0.4012
Dep. Mean	3.52926	Adj R-sq	0.3909
C.V.	34.28846		

Parameter Estimates

Variable	Parameter Estimate	Standard Error	T for HO: Parameter=0	Prob > T	Variance Inflation
INTERCEPT	0.324516	0.14023606	2.314	0.0208	0.00000000
Background					
Various experience	-0.134552*	0.06981322	-1.927	0.0541	1.15494740
Live w/ parents	0.208693**	0.06429677	3.246	0.0012	1.55483200
Live w/ relatives	0.263556*	0.15535677	1.696	0.0899	1.07310748
Board w/non-relat.	-0.468119**	0.22180810	-2.110	0.0349	1.06059429
Live w/ friends	0.161882*	0.09002114	1.798	0.0723	1.19831981
Personal income	0.000005967**	0.00000188	3.176	0.0015	1.34129422
Father. < 8th grad.	0.213324**	0.09982479	2.137	0.0327	1.06817218
Father. 9th-11th	0.315579**	0.10178694	3.100	0.0020	1.03118683
Factor for select. of CPCC					
Attend day & even.	-0.190523**	0.08440607	-2.257	0.0241	1.01451013
Prefer afternoon	-0.142793*	0.07709924	-1.852	0.0641	1.02112020
Crse allw at own pace	0.033215**	0.01684108	1.972	0.0487	1.29993432
Crse taken by mail	-0.073594**	0.02817209	-2.612	0.0091	1.31335447
Channel of information					
Prefer college ctg	0.041108**	0.01593065	2.580	0.0099	1.30202649
Mailed to home	0.453938**	0.11104923	4.088	0.0001	2.55442229
Pick up on campus	0.479621**	0.19729387	2.431	0.0151	1.40271141
Charlotte Observer	0.803282**	0.15115972	5.314	0.0001	1.87561812
In Break	1.276539**	0.55884830	2.284	0.0224	1.06409019
Call & receive schdl	0.703315**	0.26128453	2.692	0.0072	1.19882554
Facilities & Services					
Qty. admissions	0.057263**	0.01586832	3.609	0.0003	1.22761312
Qty. veterans svc	-0.052611**	0.02058013	-2.556	0.0106	1.36913059
Use of veteran svc	0.133829**	0.05075772	2.637	0.0084	1.50242375
Use of drop-in cntr	0.057152*	0.03319881	1.722	0.0853	1.37750587
Use of co-op svc	-0.130851**	0.04876935	-2.683	0.0073	1.43568951
Classroom facilities	0.095572**	0.02259223	4.230	0.0001	1.40354249
Study & read. areas	-0.028493*	0.01626930	-1.751	0.0800	1.48505631
Helpfulness of staff	0.026624*	0.01543757	1.725	0.0847	1.23095340
Talking w/ instructor	0.177430**	0.02289770	7.749	0.0001	2.19697371
Drop because instr.	-0.032898*	0.01696036	-1.940	0.0525	1.26488697
Drop because parking	-0.047587**	0.01951482	-2.439	0.0148	1.17173764
Drop because personal	0.034039**	0.01553094	2.192	0.0285	1.19564436
Opinion of amenities					
Qty. eating facilit	-0.035291*	0.01827350	-1.931	0.0536	1.43437672
Qty. secu/safety	-0.031737*	0.01832199	-1.732	0.0834	1.48524587
Overall image	0.081981**	0.02265547	3.619	0.0003	1.68275954
Race relations	0.113400**	0.02437434	4.652	0.0001	2.22793353
Przac. other like me	0.115133**	0.02615586	4.402	0.0001	2.63824896
Sex, students in cls	0.130511**	0.02824008	4.621	0.0001	3.18537871
Jobs, students in cls	0.041114*	0.02349189	1.750	0.0802	2.26598108

4.2. OVERVIEW OF THE ESTIMATES

Following the convention in empirical analysis, significant factors are indicated by one or two attached asterisk (*). One asterisk indicates that the estimate is significant at 90% level, while two asterisks indicate a significance level of 95%. The significance level may be interpreted in different words without changing fundamental meaning. Here we only stress that the findings are not due to chance: we are ninety percent or ninety five percent sure that the relationship found from the sample is also true for the entire college population.

Almost forty internal and external factors are systematically related to the overall quality indicator, but no single factor dominates the relation. Some internal factors, such as lab and industrial shop facilities, quality of instruction, and course availability, were expected to be very important, but the estimates do not empirically agree with the expectation: these factors are not significantly related to student satisfaction with the overall quality of the college. Neither positive nor negative relation between these factors and student satisfaction is found. This finding implies that the relationship between the overall quality and its determinants is complicated, and quality of a particular area of facilities/services does not necessarily contribute to or hurt the overall quality of the college. To identify the major contributors to the overall quality and troubling areas, we must examine the unique relation between each factor and the overall quality.

4.3. INFLUENCE OF STUDENT BACKGROUND ON STUDENT SATISFACTION

Because student background variables are not a major concern of this study and they primarily serve as controls, we only briefly discuss the estimates. Obviously, some student background factors have affected student satisfaction with the overall quality of CPCC. This may be largely because students with different backgrounds have different needs and expectations for facilities and services. In general, students with various experience or board with a family but not relatives are not satisfied with the overall quality of the college. This can be interpreted as a greater needs or expectations of these students for the college. Students with other variety of background listed in the table are likely to be satisfied with the overall quality. It is worth pointing out that students whose fathers are least educated (i.e., completed 11th grade or less) greatly appreciate the overall quality CPCC possesses. The estimates indicate that it is easier for CPCC to satisfy this group of students than other groups. The finding that these students highly value the educational opportunity also suggests that CPCC is doing or can do well in serving a previously underserved population.

4.4. FACTORS AFFECTING SELECTION OF CPCC AND PROGRAMS/CLASSES

The factors affecting selection of CPCC and particular programs/classes may also influence student satisfaction with overall quality of the college. The estimates show that students attending both day and evening classes tend to complain about the overall quality of CPCC. It is logical that students attending both day and evening classes spend more time on campus and demand more and better facilities, services, and campus amenities. Because of their status, these students also tend to compare this campus with other college/university campuses dominated by full-time students. Obviously, CPCC currently cannot meet these students' needs very well. Based on the sample estimate, this group represents only about 10 percent of the population, but their strong feeling is statistically overwhelming. To a less extent, students preferring afternoon classes are also likely to complain about the overall quality of the college.

Most measures used to offer classes have no apparent influence on student satisfaction with two exceptions. Courses that allow students to work at their own pace and courses students can take by mail show up as significant determinants of student satisfaction. However, the impacts of the two factors are just the opposite: the first measure of customizing classes to meet individual needs is seen by students as an addition to the overall quality of the college, while the second approach led the beneficiaries to a less satisfactory position. Descriptive statistics (see Table 3.9) show that only about 13% of students consider that courses they can take by mail are somewhat important to very important for them to select CPCC programs and classes, but, obviously, this small group has very strong feelings. Because the students who take classes by mail normally cannot access most facilities and services on the main campus, the overall quality of CPCC these students perceive can only be reflected through mailed items. The limited access to campus is partly responsible for the estimated negative relation between the factor and student satisfaction with overall quality. It should be stressed, however, that the quality of the classes offered through mail is perhaps more important than those offered on campus because no supplemental help is available for the students taking classes by mail. We may need to make some improvements on these classes if we decide to better meet these students' needs.

4.5. IMPACTS OF DIFFERENT CHANNEL OF RECEIVING INFORMATION

Of more than twenty variables in this group, seven are related to student satisfaction with the overall quality of CPCC. The estimated relations are all positive. Generally, the ways to keep students informed about available courses and programs of study do not make a big

difference in student satisfaction. An exception is that students who like college catalogs tend to value the overall quality slightly higher. The ways to receive class schedule do not have much influence either. Having copies to reach students according to their preferences can almost always make the students more satisfied, although the increase in overall satisfaction is somewhat different.

4.6. INFLUENCE OF QUALITIES OF FACILITIES AND SERVICES

The influence of qualities of facilities and services on the overall quality of the college is a major interest in this study. As justified at the beginning of this section, this is approximated by the relation between student opinion of each area of facilities/ services and student satisfaction with overall quality of CPCC. Because quality of each area of facilities and services tends to contribute to the overall quality of the college, it is expected that student satisfaction with each individual area of facilities and services is positively related to satisfaction with the overall quality of CPCC. However, Table 4.1 seems to provide a picture slightly different than expected, many estimates are consistent with expectation though.

Students considering that CPCC provides excellent veterans service tend to be less satisfied with the overall quality. It is conceptually difficult to justify that high quality of veterans service could damage the overall quality of an institution. A possible reason is that those considering CPCC has excellent veterans service are not veterans and those students prefer to see excellence to appear in other service areas. Another parameter estimate supports this inference: use of veterans service has a significant positive estimate. This means that those who do use veterans service frequently are likely to express additional appreciation to the overall quality of CPCC.

Those who believe students drop out of classes at CPCC because of the problem of instructors tend to give CPCC a low grade on the overall quality. This reflects student opinion of the quality of instructors. However, this finding seems to contradict the descriptive statistics presented in Table 3.12, section 3. In their answers to the more direct questions about the qualities of instructions of full-time and part-time instructors, most students assigned a fairly high grade to both full-time and part-time instructors, and only a small percentage (5.2% for full-time and 8.9% for part-time instructors) of the total students feel the quality of instructors is below average. The estimated strong relationship between talking with instructors and overall satisfaction also suggests a positive contribution of instructors to the overall quality of the college. In combination, these messages suggest the following: a majority of students feel the quality of the instructions/ instructors is good or excellent, while a small portion of the students

feel the quality of instruction/ instructors is poor or below average; more importantly, the majority's feeling is not as strong as that held by the minority; regardless of the quality of instructions/ instructors, talking to students about their performance is highly appreciated by these students.

Other estimates are basically consistent with expectation. Quality of administration, classroom facilities, helpfulness of staff, and talking with instructors about my performance in class all have positive signs, implying the contribution of quality of each area to the overall satisfaction. Of these four factors, talking with instructors is by far the most significant contributor to the overall quality with statistical significance level much higher than any other, while classroom facilities have the largest influence on the overall quality with parameter estimate greater than others⁹. It seems also consistent with expectation that those believing some students drop out of classes at CPCC due to parking difficulties are generally less satisfied with CPCC. However, it is worth noting that this is a less direct measure compared with the answers to the questions about direct opinion of parking facilities and availability. Although a large number of students feel the parking facilities and availability are poor or below average (39% and 45.9% respectively, see Table 3.16, section 3) with sample means of 2.72 and 2.54 respectively, these two factors do not show up at any commonly accepted significance level in the estimation. These estimates, to some extent, undermine the importance of the parking difficulties as a significant negative factor to the overall quality of CPCC. Further study needs to be conducted to generate more consistent conclusion.

Several other estimates reveal difference in opinion among different groups of students. Those who use drop-in center more frequently tend to be more satisfied with the overall quality, meaning that drop-in center is doing well to add additional quality to the college. On the other hand, students who frequently use co-op services generally give CPCC a lower quality grade, implying that Co-op service may need some improvement. The descriptive statistics (see Table 3.13, section 3) indicate that these two factors receive similarly diverse quality grades from students and have similar sample mean of the grades with 2.84 for drop-in center and 2.95 for co-op services. The statistical estimates imply that

⁹ Significance level is measured by a T statistic and a probability that the estimate is obtained due to sample chance. The higher the significance level, the more likely the estimated relation is to exist in the study population. On the other hand, the magnitude of a parameter estimate indicates the amount of change in the dependent variable (student satisfaction with the overall quality of CPCC, in this particular model) resulting from one unit change in the independent variable (in this model, one level change in the five-level scale measure of the quality of a facility/ service factor).

the students who assign drop-in center a high grade have much stronger feeling than those who give the center a low grade. The situation for co-op services is just reversed with much stronger feeling showing up in the students who are not satisfied with the services. Descriptive statistics also show that only 307 students have ever used co-op services. It seems possible to make some improvement in the services without a large investment.

The estimate also indicates that those who believe some students drop out of classes at CPCC due to personal problems tend to highly appreciate the overall quality of CPCC. But this estimate does not show any meaningful causal relation between facilities/services and the overall quality. It is more likely that those who express a high degree of overall satisfaction with CPCC would attribute student drop-out to personal problems. The statistical significance of the estimate indicates that the feeling is firmly held by those students.

Other facilities and services expected to be relevant to the overall quality of the college do not show up as significant factors. More precisely, most students do not consider those factors are contributors to the overall quality of CPCC (see Table 3.12 and Table 3.13 for those factors included in the study). This may be an interesting piece of information to the college decision makers when they need to make plans to improve the overall quality of CPCC and to meet students' needs in a cost-effective manner.

4.7. RELATION OF CAMPUS AMENITIES AND THE OVERALL QUALITY

The final group of the estimates in Table 4.1 presents the relationship between campus amenities factors and the overall quality of the college. Of a larger number of factors, only the significant factors are shown in the list. With two exceptions, most factors have an expected positive relation with the overall quality grade.

It is not surprising that overall image of a college contributes to the overall quality of the institution, and vice versus. They are mutually causally related to each other. Four social environmental factors are closely related to the overall quality. Students who are comfortable with race relations climate on the campus, presence of other people like themselves, sex ratio of students in the classes, or jobs held by their classmates are all likely to have greater appreciation for the overall quality of CPCC. Estimates also indicate the four factors are

associated with each other¹⁰. Therefore, a student who is comfortable with any of the four factors tends to be comfortable with the overall campus social environment, and the grade he or she assigns to the overall quality of CPCC is higher by about 0.5 in a 5-level scale.

Two amenity factors have unexpected signs. Those who give high grade to the quality of eating facilities and campus safety are likely to be less satisfied with the overall quality of the college, nevertheless, the estimates are smaller and significant only at 90% level, lower than most other estimates. Moreover, simple correlation coefficients between these two factors and the overall satisfaction are both positive, 0.1090 and 0.1766 respectively. This suggests that the smaller negative estimates are very likely to have entered into the model as a minor adjustment to other overestimated positive estimates. We can basically ignore these estimates.

4.8. COST-EFFECTIVE APPROACH TO IMPROVING THE OVERALL QUALITY

Given the statistics describing strength/weakness of each area of facilities and services (refer to section 3) and estimated underlying relation between each area and the overall quality indicator, it is possible to find a cost-effective approach to improving the overall quality. This subsection combines the findings and point out areas where improvements are needed and the improvement tends to bring about an increase in the overall quality of CPCC.

Table 4.2 presents the list of influential internal factors, which are estimated to affect the overall quality of CPCC, and the percentage of students considering these areas are good or excellent. The factors with a smaller percentage of satisfied students may be the major areas the college should work on in order to improve the overall quality, while the factors with a larger percentage of satisfied students need to maintain their position.

¹⁰

As shown in the table below, correlation coefficients between these four factors are from 0.57 to 0.72. The variance inflation factors in the Table 4.1 also provide evidence of the correlation.

Correlation Coefficients				
	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.00000			
Race relation climate	0.0	0.68296	0.65118	0.57073
		0.0	0.0001	0.0001
Factor 2	0.68296	1.00000		
Prsnce of others like me	0.0	0.0	0.71502	0.61559
			0.0	0.0001
Factor 3	0.65118	0.71502	1.00000	
Gender of classmates	0.0001	0.0	0.0	0.70926
				0.0
Factor 4	0.57073	0.61559	0.70926	1.00000
Jobs held by classmates	0.0001	0.0001	0.0	0.0

Table 4.2. Influential Contributors and Performance

Major Factors	Satisfied Student	Average Score
Quality of admission services	41.5%	3.43
Classroom facilities	48.6%	3.62
Talking w/ instructor	49.8%	3.68
Helpfulness of staff	57.8%	3.74

The above four factors are facilities and services-related factors, over which the college has some control. The statistics show that only 41.5% of students feel the quality of admission services are good or excellent, indicating much room for improvement. Similarly, classroom facilities, opportunity for students to talk with instructors about their performance, and helpfulness of staff are all important contributors to the overall quality of the college and can be improved substantially.

Many other amenity factors also contribute to the overall quality. For instance, race relation climate, jobs held by classmates, sex ratio of classmates, and presence of similar people in classes all contribute to student satisfaction with the overall quality. Although the college is less likely to manipulate these factors substantially, it is important to be aware of the importance of these factors to the overall quality of the college.

Although many other areas of facilities and services may be considered to be important to the overall quality, no systematic relation is found in the study. Inputs in those areas are less likely to result in desired improvement on the overall quality of CPCC.

5. SUMMARY AND CONCLUSION

This study investigates current student opinion of CPCC facilities, services, and amenities, using descriptive statistical methods. The study also examines the relationship between these facility/service/amenity factors and the overall quality of CPCC, based on student opinion/satisfaction indicators. The research yields interesting findings which may be used to evaluate performance of each area of CPCC and, thereby, support consideration of improvement upon identified crucial areas.

Based on the student background analysis, a few points may be highlighted. First, CPCC serves an area significantly larger than that served by an average community college. Second, the students have a variety of education and work experience, only about a quarter of them entering CPCC directly following high school graduation. Third, most students work while attending CPCC classes, and many of them have significant income from their current job. Fourth, either because the students are well motivated or because CPCC provides a better educational opportunity or because of both reasons, a large proportion of the students tend to do better than their parents. In summary, CPCC currently serves a wide scope of population with different social and economic statuses in a larger area. We may need to keep this background in mind when making any significant decision.

The descriptive statistical analysis reveals that current students are more satisfied with certain areas of facilities/services/amenities than some other areas. The areas perceived to possess high quality include library, instruction of full-time faculty, accessibility of resource materials, classroom facilities, and lab facilities. Most other areas are considered to possess reasonable quality, and campus social environmental factors are felt to have the most consistent above average scores. However, this study also reveals that a few areas may need improvement. These areas include co-op services, drop-in center, orientation program, and student parking. A disturbing finding is the decrease in mean scores of many facility and service areas over the past two years, although the finding is not conclusive due to the different samples.

The systematical statistical analysis draws a picture of significant relation between individual areas of facilities/services and the overall quality. The research findings indicate that some areas are important contributors to the overall quality and some other areas are not systematically related to the overall quality. Improvement on the areas which are contributors is expected to raise the overall quality of the college, while inputs in the areas without significant relation with the overall quality are less likely to result in an improvement of the

overall quality. The analysis and findings imply a cost-effective avenue to upgrade the overall quality of CPCC, assuming that the relation estimated stays about the same in the near future. Identified areas, on which improvement may result in a gain in the overall quality, include admission services, classroom facilities, availability for students to talk with instructors about the students' performance in classes, and Helpfulness of staff.

This study is the first attempt to relate individual areas of facilities, services, and amenities to the overall quality of the college. The indicators of qualities of the areas and the overall quality are far from accurate. Student opinion, particularly the satisfaction with the overall quality of CPCC, is not exactly equivalent to the quality of the college. The impact of each significant internal factor on satisfaction should not be literally interpreted as the influence of the factor on the overall quality of CPCC. Moreover, many relevant college internal and external factors are not included in the study. This may result in some bias of the estimated relation if omitted factors are related to the factors included. For all of these reasons, the findings presented in this report are tentative. Further study is needed to accumulate evidence of the relationship between each area and the overall quality in order to find the most cost-effective approach to improving the overall quality of CPCC.

APPENDIX A
SURVEY INSTRUMENT

Central Piedmont Community College
Student Opinion and Evaluation Questionnaire
(Currently Enrolled Students)

1. Social security number _ _ _ _ _ (optional)

2. When do you primarily (A) attend class (P) prefer to attend class?

A	P	
—	—	a. In the morning (7:30 - 12:30)
—	—	b. Afternoon College (12:30 - 5:30)
—	—	c. In the evening (after 5:30 pm)
—	—	d. Both day and evening

3. What is the distance you travel (one way) to attend class? Check the appropriate box.

☐ a. 0-3 miles	☐ d. 21-30 miles
☐ b. 4-10 miles	☐ e. 31-50 miles
☐ c. 11-20 miles	☐ f. over 50 miles

4. What were you doing before you first entered CPCC?

☐ a. Entered before completing high school
☐ b. Entered after completion of high school
☐ c. Entered after working for a period of time (other than just summer work)
☐ d. Transferred from another 2-yr college
☐ e. Transferred from a 4-yr college or university
☐ f. Entered after completing military service
☐ g. Entered after raising a family.
☐ h. Other _____

5. What influenced your selection of CPCC? Using a scale of 1 to 5, with 1 being "not important," 3 being "somewhat important," and 5 being "very important," rate the importance of each of the following items. Write a number in each box at left.

not important	somewhat important	very important
1	2	3
4	5	

☐ a. Convenient location
☐ b. Offers desired academic programs/courses
☐ c. Low tuition cost
☐ d. Academic reputation
☐ e. Relevance to job
☐ f. Easy transfer of credits
☐ g. Strong academic advising
☐ h. Availability of job placement/career development
☐ i. Unable to attend another college because of grades
☐ j. Accessible by public transportation
☐ k. Could work while attending college
☐ l. Small classes
☐ m. Availability of financial aid

6. Who influenced your decision to attend CPCC? Using the scale of 1 to 5, with 1 being "not important," 3 being "somewhat important," and 5 being "very important," rate the importance of each person(s). Write a number in each box.

- ☐ a. Advice of friends
- ☐ b. Advice of high school counselors/teachers
- ☐ c. Advice of parents
- ☐ d. Recruiter, teacher, some staff member at CPCC
- ☐ e. Employer
- ☐ f. Teacher or some other person at a 4 yr. school
- ☐ g. Spouse

7. What influenced your choice of course or program? Using the same scale of 1 to 5, with 1 being "not important," 3 being "somewhat important," and 5 being "very important," rate the importance of each of the following items. If not sure put "0". Write a number in each box.

- ☐ a. A centralized location for classes
- ☐ b. Courses offered off campus near home
- ☐ c. Courses offered at place of work
- ☐ d. Courses offered on videotape
- ☐ e. Courses offered on TV
- ☐ f. Courses offered on radio
- ☐ g. A combination of TV and in-class learning
- ☐ h. Courses that allow you to work at your own pace
- ☐ i. Courses you can take by mail

8. What is your opinion of the following services? Using the same scale of 1 to 5, with 1 being "poor," 3 being "average," and 5 being "excellent," rate your opinion of the following services. If no opinion, write "0." Write a number in each box. Also, use A,B,C to indicate how much you use these services. Please circle the appropriate letter.

	Not Used	Little Used	Regularly Used
☐ a. Admissions	A	B	C
☐ b. Orientation program	A	B	C
☐ c. Placement Testing and Testing Center	A	B	C
☐ d. Records/transcripts	A	B	C
☐ e. Counseling	A	B	C
☐ f. Registration	A	B	C
☐ g. Business office/Cashier	A	B	C
☐ h. Veterans Services	A	B	C
☐ i. Academic Advising by faculty	A	B	C
☐ j. Services for students with disabilities	A	B	C
☐ k. Financial Aid	A	B	C
☐ l. Drop-in Center	A	B	C
☐ m. Job placement assistance	A	B	C
☐ n. Co-op Services	A	B	C
☐ o. Bookstore	A	B	C
☐ p. Welcome/information center	A	B	C

9. What is your opinion of the following campus factors? Using a scale of 1 to 5, with 1 being "poor," 3 being "average," and 5 being "excellent," rate your opinion. If not sure put "0." Write a number in each box.

- ☐ a. Classroom facilities
- ☐ b. Lab facilities
- ☐ c. Industrial arts/shop facilities

- ☐ d. Library
- ☐ e. Accessibility of resource materials (books, videos, etc.)
- ☐ f. Study and reading areas

- ☐ g. Accuracy of information received before enrolling
- ☐ h. Quality of instruction of full-time faculty
- ☐ i. Quality of instruction of part-time faculty

- ☐ j. Course availability
- ☐ k. Helpfulness of administrators
- ☐ l. Helpfulness of staff

- ☐ m. Reading, writing, language skills improvement programs
- ☐ n. Math skills improvement programs

10. What is your opinion of the following student oriented factors? Using a scale of 1 to 5, with 1 being "poor," 3 being "average," and 5 being "excellent," rate your opinion. If not sure put "0." Write a number in each box.

- ☐ a. Campus life (activities)
- ☐ b. Student Government
- ☐ c. Student Center, lounge area
- ☐ d. College newspaper (The Spark)

- ☐ e. Parking availability
- ☐ f. Parking facilities
- ☐ g. Eating facilities

- ☐ h. Early performance report (Mid-term progress report)
- ☐ i. Personal security/safety
- ☐ j. Attractiveness of campus
- ☐ k. Overall image of CPCC

11. If you rated any item in questions 8-10 as "poor," please explain.

12. In your opinion, why do students drop out of classes at CPCC? Rank in order the following reasons with 1 being "least important," and 5 being "most important."

- ☐ a. Course difficulty
- ☐ b. Instructor
- ☐ c. Parking difficulties
- ☐ d. Personal problems having nothing to do with the College
- ☐ e. Other (specify) _____

13. How important are the following factors in keeping you informed about available courses and programs of study? Using the scale of 1 to 5, with 1 being "not at all," 3 being "somewhat," and 5 being "very much," rate each item. If not sure, write "0." Write a number in each box.
- ☐ a. Mailed circulars ~~that come to~~ your home
 - ☐ b. Newspaper advertisements
 - ☐ c. Television advertising
 - ☐ d. Radio advertising
 - ☐ e. Schedule of classes that comes in the newspaper
 - ☐ f. Stories ~~that appear in the~~ newspaper
 - ☐ g. College catalogs
 - ☐ h. "Win" and other brochures
 - ☐ i. The Sunday Charlotte Observer
14. How would you like to get a copy of the schedule of classes?
- ☐ a. Mailed to my address each quarter
 - ☐ b. Pick up on campus from a convenient place
 - ☐ c. In the Charlotte Observer
 - ☐ d. In the Charlotte Post
 - ☐ e. In Creative Loafing
 - ☐ f. In Break
 - ☐ g. Call and have a schedule mailed when I want one
15. Check the types of radio stations you listen to most often.
- | | |
|---|---|
| ☐ a. Easy listening | ☐ f. News/Public broadcast |
| ☐ b. Hard rock | ☐ g. Religious |
| ☐ c. Country and western | ☐ h. Rap |
| ☐ d. Oldies | ☐ i. Blues/jazz |
| ☐ e. Classical | ☐ j. Other _____ |
16. Give the call letters and/or frequency of the station you listen to most often.
- a. Call letters _____ b. Frequency _____ AM FM
17. Where do you currently live?
- ☐ a. With parents
 - ☐ b. With spouse and children, if any
 - ☐ c. With children, but no spouse
 - ☐ d. With other relatives
 - ☐ e. Board with a family, not relatives
 - ☐ f. By myself
 - ☐ g. With friends/roommate(s)
 - ☐ h. Other residence, not listed here

18. What was the total income for you and your spouse (if you are married) from all sources before taxes during the past year (1991). Circle the Y column for you and/or spouse and the P column for your parents. Estimate if you are not sure.

Y P Less than \$5,000
Y P \$5,000 - 10,000
Y P \$10,000 - 15,000
Y P \$15,000 - 20,000
Y P \$20,000 - 25,000
Y P \$25,000 - 30,000
Y P \$30,000 - 35,000
Y P \$35,000 - 40,000
Y P \$40,000 - 50,000
Y P \$50,000 and above
P Parents no longer living

19. How many people in your household depend on you for more than half their financial support? Write the number of dependents in each age group.

[] 1. Under 5 years
[] 2. 5-9 years
[] 3. 10-14 years
[] 4. 15-19 years
[] 5. 20-24 years
[] 6. 25 and older

20. What is the highest level of education your father (F) has completed? Your mother (M) has completed? Please answer for each, even if your parents are no longer living. Estimate if you are not sure.

F M 8th grade or less
F M 9th - 11th grade
F M High School graduate
F M GED diploma

F M One year beyond high school
F M Diploma program
F M Two years of college
F M Associate degree

F M Three years of college
F M College graduate
F M Graduate work

21. Using a scale of 1 to 5, with 1 being "uncomfortable," 3 being "comfortable," and 5 being "very comfortable," rate your opinion of the following at CPCC. Write a number in each box.

- ☐ a. Race relations climate
- ☐ b. Presence of other people like me that I can relate to
- ☐ c. Minority presence (students, faculty, administrators, literature)
- ☐ d. Talking with counselors
- ☐ e. Talking with instructors about my performance in class
- ☐ f. Age of students in my classes
- ☐ g. Sex of students in my classes
- ☐ h. Academic ability of students in my classes
- ☐ i. Jobs held by the students in my classes
- ☐ j. Social class of students in my classes

22. Using the scale of 1 to 5, with 1 being "not satisfied," 3 being "somewhat satisfied," and 5 being "very satisfied," rate your satisfaction with the overall quality of CPCC?

- ☐ a. Overall quality of CPCC

23. What do you like best about CPCC?

24. What is the most important thing that needs to be improved at this community college and how could this be improved?

25. Would you recommend this college to someone else?

- ☐ a. Yes
- ☐ b. Maybe
- ☐ c. No

If you answered "Maybe" or "No," explain.

APPENDIX B
SUMMARY OF STUDENT COMMENTS

STUDENT COMMENTS

Several questions on the survey asked for open-ended responses. The following designates the question, the overall response and specific quotes on each item.

- 11- If you rated any item in question 8-10 as "poor," please explain.

When asked to explain poor ratings on service, campus factors and student factors, the most often mentioned problem was parking. Fifty-five percent of the responses mentioned parking problems.

Some quotes were:

"PARKING, PARKING, PARKING!"

"There is not enough parking!"

"Parking is the pits!"

"Parking is a serious problem."

"Parking is the worst part of my life."

Students indicated two other areas for concern which were eating facilities and security. Some quotes about eating facilities included:

"Need a cafeteria because of crowds."

"Snackbar overcrowded."

"Snackbar too small."

"Need a place to study while eating."

Comments on security showed concerns for safety. Some quotes on this subjects were:

"Need more patrols through the parking decks."

"Not enough security."

"Can't find security after night classes."

Several students mentioned that the mid-term report was not needed. Some of their comments were:

"Mid-term report not in depth."

"Performance report too soon to evaluate work."

Other concerns were difficulties seeing a counselor, rudeness from certain departments, and long lines for bookstore and registration. These problems were described in the following quotes.

"Staff needs a positive attitude"

"Staff not friendly"

"Person helping me kept answering the phone"

"There should be a counselor available on a daily basis"

- 16- Give the call letters and/or frequency of the station you listen to most often.

Approximately 102 stations were mentioned by the 2,375 students responding to this question. However, there were five stations with over 100 people naming them as station listened to most often. Those stations were:

STATION	NUMBER
WRFX	253
WPEG	175
WTDR	137
KISS	131
WFAE	117

The next most popular stations were:

WSOC	77
WXRC	61
WBT	55

23- What do you like best about CPCC?

When asked what they liked best about CPCC, the most frequent responses identified low cost, convenient location, and instructors. Other items included academic reputation, friendly people, small classes, beauty of campus, and pleasant atmosphere. Some of the quotes were:

"Low tuition and good financial aid"
 "Convenient location"
 "EVERYTHING"
 "Faculty, good instructors"
 "The instructors are willing to work with students"
 "Programs geared to job demands, other classes"
 "The help everyone gives"
 "I like being able to attend CPCC at night."
 "I can work and go to school."
 "Instructors!"
 "The layout of the campus and how well it is kept up"

24- What is the most important thing that needs to be improved at this community college and how could this be improved?

When asked about most important thing at CPCC that needs improvement and how this could be accomplished, parking was the most often mentioned problem. Fifty-five percent of responses included parking problem. Other needed improvements included easy access to counselors, availability of classes, improvement of instructors. Quotes included:

"Parking - build more parking decks."
 "Availability of counselors to students."
 "Student campus safety and security, high visibility by police and security."
 "Need different instructors to teach same classes so don't have the same instructor teaching all sections of one class."
 "Classes that are required but not offered - all classes should be offered at least two times per year."
 "We need a system of letting students know about advisors (not the bulletin boards) - maybe handouts in transfer programs."

25- Would you recommend this college to someone else? If you answered "Maybe" or "No," explain.

Very few people indicated there might be a time when they would not recommend CPCC to someone else. The explanations indicated it would depend on the fit with area of interest for the student. The following quotes offer reasons.

"Depends who they are and the classes they are interested in"

"1000x's over !! This is the best bargain in town - no reason anyone can't attend school if they want to! The support system here challenges and promotes successful students."

"Dependent on program"

"It lacks the college life without dorms"

"It depends on the situation"

"It would depend on course offerings vs what they need"